

AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) A method for simulating a multi-dimensional space, comprising:
generating a sequence of pseudo-random numbers according to a prescribed quasi-Monte Carlo model; ~~and~~
mapping each pseudo-random number R of the sequence of random numbers into multiple variables of unique values for the multi-dimensional space, the multi-dimensional space including D dimensions, where D is a number; and selecting a value of S according to a desired accuracy of a final simulation value, wherein the value of S defines a grid for use in conjunction with the mapping of the pseudo-random numbers into the multiple variables of the multi-dimensional space, wherein each of the multiple variables of the multi-dimensional space represents a corresponding D dimension value and wherein each dimension is characterized by a minimum and a maximum value, further wherein each dimension is characterized by a prescribed resolution S, and wherein S is the resolution of each dimension, and a ratio r, as defined by $r = s^D/P^N$ can be predetermined to be a prime number so that the value for S can be derived from the equation for r.
2. (Cancelled).
3. (Cancelled).
4. (Cancelled).

5. (Cancelled).
6. (Cancelled).
7. (Currently Amended) The method of claim [[6]]_1, wherein the D dimension values are further characterized by a first dimension D0 that includes minimum and maximum values defined as D0.min and D0.max, respectively, a second dimension D1 that includes minimum and maximum values defined as D1.min and D1.max, etceteras, up to a Dth dimension.
8. (Cancelled).
9. (Cancelled).
10. (Currently Amended) A method for simulating a multi-dimensional space, comprising:
 - generating a sequence of pseudo-random numbers according to a prescribed quasi-Monte Carlo model;
 - mapping each pseudo-random number R of the sequence of random numbers into multiple variables of unique values for the multi-dimensional space, the multi-dimensional space including D dimensions, where D is a number, wherein each of the multiple variables of the multi-dimensional space represents a corresponding D dimension value and wherein each dimension is characterized by a minimum and a maximum value, the D dimension values further being characterized by a first dimension D0 that includes minimum and maximum values defined as D0.min and D0.max, respectively, a second dimension D1 that includes minimum and maximum values defined as D1.min and D1.max, etceteras, up to a Dth dimension, further wherein each dimension is

characterized by a prescribed resolution S; and

selecting a value of S according to a desired accuracy of a final simulation value, wherein the value of S defines a grid for use in conjunction with the mapping of the pseudo-random numbers into the multiple variables of the multi-dimensional space, ~~wherein selecting the value of S includes deriving the value of S such that S is the resolution of each dimension and~~ a ratio r, as defined by $r = s^D/P^N$, ~~is not factorable by one of the following selected from the group consisting of base P and the number of dimensions D, and where N is the number of pseudo-random numbers and r is a prescribed prime number can be determined to be a prime number so that the value for S can be derived from the equation for r.~~

11. (Currently Amended) A method for simulating trace impedance of a printed circuit board characterized by at least three dimensions of a multi-dimensional space, said method comprising:

generating a sequence of pseudo-random numbers according to a prescribed quasi-Monte Carlo model; and

mapping each pseudo-random number R of the sequence of random numbers into multiple variables of unique values for the multi-dimensional space, the multi-dimensional space including D dimensions, where D is a number; and

selecting a value of S according to a desired accuracy of a final simulation value, wherein the value of S defines a grid for use in conjunction with the mapping of the pseudo-random numbers into the multiple variables of the multi-dimensional space, wherein each of the multiple variables of the multi-dimensional space represents a corresponding D dimension value and wherein each dimension is characterized by a minimum and a maximum value, further wherein each dimension is characterized by a prescribed resolution S, and wherein S is the resolution of each dimension, and a ratio r, as defined by

$r = s^D/P^N$ can be predetermined to be a prime number so that the value for S can be derived from the equation for r.

12. (Cancelled).
13. (Cancelled).
14. (Cancelled).
15. (Cancelled).
16. (Cancelled).
17. (Currently Amended) The method of claim ~~16~~ 11, wherein the D dimension values are further characterized by a first dimension D0 that includes minimum and maximum values defined as D0.min and D0.max, respectively, a second dimension D1 that includes minimum and maximum values defined as D1.min and D1.max, etceteras, up to a Dth dimension.
18. (Cancelled).
19. (Cancelled).
20. (Currently Amended) Apparatus for simulating trace impedance of a printed circuit board, the printed circuit board characterized by at least three dimensions of a multi-dimensional space, said apparatus comprising:
a random number generator for generating a sequence of pseudo-random numbers according to a prescribed quasi-Monte Carlo model;

a mapping processor for mapping each pseudo-random number R of the sequence of random numbers into multiple variables of unique values for the multi-dimensional space, the multi-dimensional space including D dimensions, where D is a number, wherein each of the multiple variables of the multi-dimensional space represents a corresponding D dimension value and wherein each dimension is characterized by a minimum and a maximum value, the D dimension values further being characterized by a first dimension D0 that includes minimum and maximum values defined as D0.min and D0.max, respectively, a second dimension D1 that includes minimum and maximum values defined as D1.min and D1.max, etceteras, up to a Dth dimension, further wherein each dimension is characterized by a prescribed resolution S; and

a value selector for selecting a value of S according to a desired accuracy of a final simulation value, wherein the value of S defines a grid for use in conjunction with the mapping of the pseudo-random numbers into the multiple variables of the multi-dimensional space, ~~wherein selecting the value of S includes deriving the value of S such that~~ S is the resolution of each dimension and a ratio r, as defined by $r = s^D/P^N$, is not factorable by one of the following selected from the group consisting of base P and the number of dimensions D, and where N is the number of pseudo-random numbers and r is a prescribed prime number can be determined to be a prime number so that the value for S can be derived from the equation for r.

21. (Currently Amended) A method of manufacturing a printed circuit board comprising:

characterizing the printed circuit board by at least three dimensions of a multi-dimensional space; and

manufacturing the printed circuit board in accordance with a simulated trace impedance, the simulated trace impedance obtained by:

generating a sequence of pseudo-random numbers according to a prescribed quasi-Monte Carlo model;

mapping each pseudo-random number R of the sequence of random numbers into multiple variables of unique values for the multi-dimensional space, the multi-dimensional space including D dimensions, where D is a number, wherein each of the multiple variables of the multi-dimensional space represents a corresponding D dimension value and wherein each dimension is characterized by a minimum and a maximum value, the D dimension values further being characterized by a first dimension D0 that includes minimum and maximum values defined as D0.min and D0.max, respectively, a second dimension D1 that includes minimum and maximum values defined as D1.min and D1.max, etceteras, up to a Dth dimension, further wherein each dimension is characterized by a prescribed resolution S; and

selecting a value of S according to a desired accuracy of a final simulation value, wherein the value of S defines a grid for use in conjunction with the mapping of the pseudo-random numbers into the multiple variables of the multi-dimensional space, ~~wherein selecting the value of S includes deriving the value of S such that~~ S is the resolution of each dimension and a ratio r, as defined by $r = s^D/P^N$, is not factorable by one of the following selected from the group consisting of base P and the number of dimensions D, and where N is the number of pseudo-random numbers and r is a prescribed prime number can be determined to be a prime number so that the value for S can be derived from the equation for r.

22. (Currently Amended) A computer system, comprising:

a printed circuit board manufactured in accordance with a simulated trace impedance, said printed circuit board including impedance traces that

characterize at least three dimensions of a multi-dimensional space of said printed circuit board , wherein said impedance traces include trace impedances obtained by:

generating a sequence of pseudo-random numbers according to a prescribed quasi-Monte Carlo model;

mapping each pseudo-random number R of the sequence of random numbers into multiple variables of unique values for the multi-dimensional space, the multi-dimensional space including D dimensions, where D is a number, wherein each of the multiple variables of the multi-dimensional space represents a corresponding D dimension value and wherein each dimension is characterized by a minimum and a maximum value, the D dimension values further being characterized by a first dimension D0 that includes minimum and maximum values defined as D0.min and D0.max, respectively, a second dimension D1 that includes minimum and maximum values defined as D1.min and D1.max, etceteras, up to a Dth dimension, further wherein each dimension is characterized by a prescribed resolution S; and

selecting a value of S according to a desired accuracy of a final simulation value, wherein the value of S defines a grid for use in conjunction with the mapping of the pseudo-random numbers into the multiple variables of the multi-dimensional space, ~~wherein selecting the value of S includes deriving the value of S such that~~ S is the resolution of each dimension and a ratio r, as defined by $r = s^D/P^N$, is not factorable by one of the following selected from the group consisting of base P and the number of dimensions D, and where N is the number of pseudo-random numbers and r is a prescribed prime number can be determined to be a prime number so that the value for S can be derived from the equation for r.